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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/633,782	08/07/2000	Gun-Hee Lee	3430-0129P	3862

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EXAMINER

NGUYEN, HOAN C

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/633,782

Applicant(s)

LEE ET AL.

Examiner

HOAN C. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/17/03 has been entered.

Response to Amendment

In this office action, examiner uses better reference **Hisatake et al. (US6300929B1)** for rejections of independent claims 1 and 12 with the clear motivation of turning upside down or 180° a whole liquid crystal cell.

In remark (page 11 lines 11-16), applicant states "a second advantage (stated by the Applicants) is that turning the TFT upside down eliminates a need for the second black matrix. This not only reduces the number of black matrices required by the device (without impairing the function thereof), but the removal of the second black matrix actually improves the device." Nowhere in the original specification stated this advantage.

However, the original specification (page 4 lines 19-21) disclose "It is an objective of the present invention to provide a liquid crystal display device having a high

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image quality of contrast, high aperture ratio and a simplified substrate-aligning process." The original specification (page 4 lines 8-18) discloses the advantage of related arts (Figs. 1-2) to remove the second additional black matrix but does not mention **turning the TFT upside down**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manakata (US6373540B1) in view **Hisatake et al. (US6300929B1)**.

In regard to claims 1 and 2, Manakata teaches (Figs. 2A-2D, 3A-J, col. 7 line 42 to col. 9 line 36) a liquid crystal display device comprising:

- display panel (**by turning upside down or 180° a whole liquid crystal cell,** **please see Respond to Arguments of Final Office Action**) including a lower layer 1 at the lowest portion of the display panel and an uppermost layer 2, positioned above the lowest layer at the uppermost portion of said display panel;
- first substrate (lower substrate 2) forming an uppermost layer of said display panel including
 - a) a switching element (thin film transistor 8) on the first substrate

- b) a passivation film (interlayer insulating film 20) formed over the whole surface of the first substrate while covering the switching element;
 - c) a pixel electrode (light reflection layer 9 acting as pixel electrode) on the passivation film;
 - d) a black matrix BM formed on the passivation film and over the switching element;
 - e) a color filter (planarizing layer 14 made by coloring photoresists) formed over the pixel electrode;
 - f) a first orientation film 15 formed on the black matrix and the color filter and above the pixel electrode.
- a second substrate (upper substrate 1) aligned with the first substrate having a common electrode 6 and a second orientation film 7, the orientation film formed on the common electrode; The second substrate having no switching element disposed thereon, forming said lowest portion of the display and being aligned with the first substrate and both first substrate and said switching element thereon being turned upside down since the **whole liquid crystal cell turns upside down**;
 - sealing the first and second substrates with a sealant; **This is a well known prior art for keeping liquid crystal layer from environment.**
 - a liquid crystal layer 3 interposed between the first and second substrates.

In regard to claim 12, Manakata teaches (Figs. 2A-2D, 3A-J, col. 7 line 42 to col. 9 line 36) a method of manufacturing a liquid crystal display device, which comprises an array of thin film transistors and an array of pixel electrodes including:

- forming a gate line and a gate electrode on a first substrate said first substrate forming the uppermost layer of a display panel, the gate electrode extending from the gate line;
- forming a gate insulating layer 17 on the exposed surface of the upper substrate while covering the gate line and the gate electrode;
- forming a semiconductor layer 18 over the gate electrode;
- forming a data line and source and drain electrodes 21/22, the source electrode overlapping one end portion of the semiconductor layer, the drain electrode overlapping the other end portion of the semiconductor layer, the source and drain electrodes spaced apart from each other, the source electrode extending from the data line;
- forming a passivation film 20 over the whole surface of the first substrate while covering the source and drain electrodes, the passivation film having a contact hole on the drain electrode;
- forming a pixel electrode (reflective layer 9 could act as pixel electrode) on the passivation film, the pixel electrode electrically connected with the drain electrode through the contact hole;
- forming a color filter 14 on the pixel electrode;
- forming a black matrix BM over the thin film transistor

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- forming a first orientation film 15 on the color filters and the black matrices;
- forming a common electrode 6 on a second substrate;
- forming a second orientation film 7 on the common electrode;
- aligning the first substrate turned upside down with the second substrate so that the first orientation film of the first substrate is opposite to the second orientation film of the second substrate with a gap there between to prevent degradation of the contact resulting from the mixing of dispersed light;

It is well known prior art that

- sealing the first and second substrates with a sealant; and injecting a liquid crystal between the first substrate and the second substrate.
- The common and pixel electrodes made of ITO for transparent property.

However, Munakata and well-known prior art fail to disclose a second substrate formed adjacent a backlight device that is disposed beneath lower substrate containing common electrode.

Histake et al. teach (figs. 4-5, col. 8 lines 38-41) a second substrate 14 formed adjacent a backlight device that is disposed under substrate 14. The structure in Fig. 5 is upside down with respect to that shown in Fig. 4 to prevent the display device from declining in display contrast due to ambient light leakage currents in the open-air use (col. 8 lines 24-28 and lines 55-57).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Munakata disclosed with a second substrate of upside down LC cell formed adjacent a backlight device for the display device from declining in display contrast due to ambient light leakage currents in the open-air use.

2. Claims 3-8 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manakata (US6373540B1) in view of **Hisatake et al. (US6300929B1)** as applied to claims 1, 2 and 12 above, in further view of Ono et al. (US5847781A).

Ono et al. teach (Figs. 3 and 7, col. 7 lines 5-16) a liquid crystal display device further comprising a light absorbing film AS formed under the semiconductor layer d0 and under the source electrode or data line DL or drain electrode SD1 for reducing reflecting or scattering from source and drain electrodes or data lines, and therefore resulting in dark display. For the same reason, a light absorbing light obviously also is formed under the gate line or gate electrode. It would have been an obvious to one having ordinary skill in the art at the time the invention was made to form a light absorbing light under the gate line or gate electrode since the examiner takes Office Notice of the equivalence of a light absorbing film AS formed under the source electrode or data line DL or drain electrode SD1 and a light absorbing light under the gate line or gate electrode for their use in the LCD art and the selection of any of these known equivalents to result in dark display would be within the level of ordinary skill in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Munakata disclosed with a first light absorbing film forming between the first substrate and the gate electrode; and a second light absorbing film forming between the semiconductor layer and the gate insulating layer for reducing reflecting or scattering from source, gate drain electrodes or data and gate lines, and therefore resulting in dark display.

3. Claims 9-11 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manakata (US6373540B1) in view of Hisatake et al. (US6300929B1) as applied to claims 1, 2 and 12 above, in further view of Ono et al. (US5847781A) as applied to claims 3-8 and 13-15 above, and in further view of Lee et al. (US6177973B1)

Lee et al teach (Fig. 1A col. 2 lines 37-45) a liquid crystal display device, wherein the common electrode made of an opaque conductive material of Aluminum or chromium, which is used to make light shielding or reflecting electrode. Thus, an opaque-conductive material may also be used for a reflective type liquid crystal display.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a liquid crystal display device as Munakata disclosed with the common electrode made of an opaque conductive material of Aluminum or chromium for light shielding or reflecting.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

HOAN C. NGUYEN
Examiner
Art Unit 2871

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